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counter 7. For a path length of 4 km (cf.Fig.4) a large projector was used consisting of an incandescent lamp (power 500 v) placed at the focus of mirror (diameter 60 cm). The power source for the lamp was a separate generator (for paths of 25 and 50 m, the lamp power was altered to 20 at the focus of a plano-convex lens of 12 cm diameter). The resolving system consisted of a monochromator with glass optics and a right angle prism. The monochromator was graduated by Neon lines and absorption bands of polysterol and water. An apparatus was attached which permitted automatic recording in the range 0.5 - 1.0 μ (Fig.2). The rate of change of spectrum (rotational velocity of prism) was maintained by using an electric motor M of constant rotation. Change in rotational direction of the monochromator drum was obtained automatically with the aid of the electromagnet $Э_2$, closing the pinion $Ш_3$ to either $Ш_1$ or $Ш_2$. $Э_2$ is worked by the relay P_1 and the contacts K_1 and K_2 and the switch C . C is attached to the drum $Б_2$ which is strictly geared to the rotation of the

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monochromator drum. On the axis of this drum is a mechanism for registering wavelengths, consisting of three discs and brushes. The voltage on key K_3 is communicated to one continuous disc. The other two discs, which are connected to this one, send, during every drum rotation, five short and one long impulse to an oscillograph. (The long impulse thus gives every rotation and the short give every 1/5 of a rotation.) The direction of rotation of the prism can be distinguished by the impulses on the spectrogram. The spectral interval being recorded can be changed by altering the contacts K_1 and K_2. The rotational rate of the prism can be varied by the rheostat R within certain limits - this assists the recording in the region 0.5-1.0 μ during a period of 1-2 minutes. The radiation was received by a photoelectric multiplier (type LS) with a caesium oxide photocathode (which had been investigated under S. F. Rodionov in the Photometry Laboratory of the Physical Science Research Institute - LGU). The integral sensitivity was 2.5 A/lm and the characteristic was linear for currents not exceeding 10^{-4}lm. The spectral sensitivity curve had two maxima - one at 0.85 μ and the other at 0.35 μ. (The

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sensitivity fell off at $\lambda = 1.1\ \mu$). In cloud experiments the incident intensity could change by a factor of a hundred so that an ordinary amplifier could not work linearly. To assist automatic recording and to conserve the linearity, three cascade circuits working in parallel were inserted into the input end (Fig.3). Each circuit consisted of a bridge layout, the variable resistance being the anode-cathode distance. The photoelectric multiplier was included in the circuit in such a way that, as the output signal increased, connection was made with less sensitive cascades. Each cascade was attached to a different oscillograph train. The layout was tested for linearity and all the cascades were found to lie within the required limits.

Measurements. The energy distribution in the source spectrum is measured with, and without, the presence of clouds. The data obtained is used for calculating the absorption factor, α, in accordance with Lambert's law:

$$\alpha = \frac{1}{l} \ln \frac{I_{o\lambda}}{I_\lambda}$$

, where l is the thickness

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of the cloud layer, $I_{o\lambda}$ is the intensity at wavelength λ in the absence of clouds and I_λ the intensity at λ for a thickness l. The measurements were made at El'brus at a height of 3000 m above sea level. The general layout for taking measurements is shown in Fig.4. The longest path led across the Baksan ravine and was used for measurements on the periphery of clouds. The large projector was placed on the Terskol peak and the receiving apparatus and the small projector on the Cheget peak. Measurements were made on all clear days, from which the best were chosen and averaged to give $I_{o\lambda}$. When cloud was present, visual and automatic measurements were made. In the first case I_λ was obtained at seven chosen wavelengths, and in the second 20-25 different wavelengths were obtained from the spectrogram. From these the absorption index was calculated. Great attention was paid to the following factors (Ref.5): (a) Control of the radiation intensity from the source and of the sensitivity of the receiver, (b) Control of the transparency stability of the clouds with time by taking many spectrograms and by subsequent selection, (c) The only material used in

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the final analysis was that for which the change in transparency of the cloud was between 5-80%. The error in optical measurements was then only 10% or less. The microstructure of a cloud at the moment of measurement was found by trapping the cloud particles and their diameter was measured by a diffraction method.

Results. Figs.5-7 give examples of the results obtained (the abscissa gives wavelength in millimicrons and the ordinate gives the absorption index α per 1 m thickness of cloud). In the lower portions of the graph the drop distribution in the cloud is given by dimensions $[n = f(d)]$ and the distribution of cross-sections $[S = f(d)]$. These figures also show the mean square diameter of the drops d_2, the partial distribution n, the cross-section S and the humidity of the clouds q. The data indicates that, within the limits of error, the absorption index in this spectral region is constant. A similar conclusion is reached from theoretical considerations - thus agreeing with the experiments. The author considers the absolute magnitudes

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obtained for the absorption index obtained optically and microphotographically. Table 1 gives the drop cross-section for the optical, α_{opt} and microphotographic, α_{micr}, methods. It follows from the last column of the table that α_{opt} is one and a half times larger than α_{micr}. This is, no doubt, due to the fact that the method used for trapping droplets does not capture droplets of less than 5μ diameter, although drops of diameters 4, 3 and 2μ and less are known to exist in clouds, and produce an absorption effect. Table 2 gives the average particle diameters obtained by a diffraction method d_{Dif} and by microphotography d_{micr}. This shows that the diameter obtained by diffraction is very close to d_{micr}; as might be expected since neither method takes count of the smallest particles.

Conclusions. 1. Experimental values of the absorption index for clouds, in the range 0.5-1.0μ, agrees with scattering theory, both in absolute magnitude and in dependence on wavelength. 2. The scattering index in strato-cumulus clouds does not depend in wavelength in the range 0.5-1.0μ. The calculations indicate that not more than 2% of the water

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drops in the cloud go to make up the microscopic and sub-microscopic fraction. 3. The data indicate that the scattering index in strato-cumulus varies for the most part between the limits 0.01-0.1 m^{-1} (corresponding to a meteorological visibility range of 40-400 m). The average value for the scattering index was found to be 0.06m^{-1} and the average cross-section 2.7 x 10^{-4} cm^{-1}. The author thanks S. F. Rodionov for his assistance. There are 7 figures, 2 tables and 5 Soviet references.

ASSOCIATION: Akademiya nauk SSSR, Institut prikladnoy geofiziki, (Academy of Sciences USSR, Institute of Applied Geophysics)

SUBMITTED: June 22, 1957.

1. Clouds--Spectrographic analysis

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SOV-49-58-6-10/12

AUTHOR: Bocharov, Ye. I.

TITLE: Weakening of Infra-Red Radiation by Water Vapour (Oslableniye infrakrasnoy radiatsii vodnymi tumanami)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 6, pp 791-795 (USSR)

ABSTRACT: It is possible in principle to measure the humidity of air in a cloud by observing the absorption of radiation in the water drops and vapour. This method is different from others with the same object in that there is no inertia, no disturbance of the medium, high sensitivity and can be used at low temperatures (Ref.1). The method has been considered by Ye. M. Feygel'son (Ref.2).

Apparatus. This is shown in Fig.1. A lamp is placed at the focus of a spherical aluminized mirror (dia.150 cm). These are placed in a chamber (1) and spectral measurements are made with an infra-red spectrometer (4) (type Perkin and Elmer) situated above the chamber. The radiation receiver is a vacuum thermoelement with a KBr window. A Brown potentiometric recorder is used. The sensitivity at maximum amplification is 1.4×10^{-9} v/scale division. The noise level is about 10^{-9}v and the drift of the zero point does not exceed 3×10^{-9}v/min.

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Weakening of Infra-Red Radiation by Water Vapour.

Measurements. These were carried out in the region 2-13 μ in artificial mists produced in the metallic cistern 1 (Fig.1) of dia.1.8 m and height 6.5 m. The injector 5 produced a drop distribution close to that found in natural clouds. Microphotos show that these have average diameters of 7-9 μ. First of all the energy distribution from the source is measured with a 100% humidity but no water drops in the chamber. Water drops are then introduced and the measurements repeated. Using the modified Lambert formula, the absorption index, α_{opt} is determined:

$$\alpha_{opt} = \frac{1}{l} \ln \frac{I_{0\lambda}}{I_{\lambda}}$$ where $I_{0\lambda}$ and I_{λ} are the intensities of radiation at wavelengtb λ in the absence and presence of mist and l is the thickness of the mist layer. In the interval 2-13 μ measurements are made at 13 wavelengths at minute intervals. Each value of I_{λ} corresponds to data on the mist structure obtained from

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microphotographs. However, errors can reach 30% so that measurements are worked out as follows: using the microphoto data on the number and distribution in size of the drops, an absorption index, α_{micr}, is calculated for each measurement:

$$(\alpha_k)_{micr} = \sum_i \pi a_i^2 K\left(\frac{2\pi a_i}{\lambda_k}\right) \qquad (1)$$

(where a is the drop radius, $K\frac{2\pi a}{\lambda}$ is a function tabulated by Stratton and Hutton). Finally, $(\alpha_{opt}/\alpha_{micr})_\lambda$ is found and averaged over all measurements.

Results. The data obtained are shown in Fig.2 (dotted line) - the abscissa gives λ in microns and the ordinate gives $(\alpha_{opt}/\alpha_{micr})_{\lambda\ average}$. The continuous line parallel to the abscissa corresponds to the theoretical value for $\alpha_{opt}/\alpha_{micr}$ using Eq.(1). The difference is mainly due to a systematic error in the method employed for testing the drop size. It was established that the number of small drops in

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artificial clouds changes with time, particularly in the first few minutes, and varies in different clouds. Owing to the large error thus found and the lack of any means of determining the quantity of small drops, α_{micr} is therefore calculated according to microphotographic data without considering the smaller drops. These latter can be roughly allowed for - it being assumed that there are about 1000 drops with diameters of 5, 3 and 1 μ. This gives an increase of 30% at 2.7 μ and of 2% at 13 μ of the calculated α_{micr}. In this way, agreement (to within ±20%) with the theoretical results is obtained. However, measurements were made both in absorption bands and in regions of high transparency - it is therefore necessary to conclude that this produces no difference. This can also be seen from the absorption spectra of water, water vapour (Figs.3 and 4) and aqueous aerosol (Fig.5). Figs.3 and 4 are taken from Ref.1. Measurements were made in the region $\lambda = 2.7$ μ. It can be seen that the

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absorption bands for liquid water are greater than for water vapour and changes of the layer thickness in the first case alter the absorption in the wings of the band more than in the second. Thus measurements of absorption bands can distinguish between the fluid and vapour components. However, the data in Figs. 3 and 4 (curve 1) indicates that the absorption bands do not change for layer thickness of saturated air from several centimetres to 6 m, although it is known that molecular complexes are formed. This can be attributed to their small number and allowed for by increasing the layer thickness. Fig.5 (curves 1 and 2) gives spectra in the region of the absorption bands for liquid water and water vapour (λ = 2.94; 2.7 μ) which were taken for an equivalent thickness of water vapour = 3 μ. Curve 3 gives, for comparison, data obtained from light passing through a water film of thickness 5 μ. (Abscissa gives wavelength and ordinate gives intensity of radiation passed). As Fig.5 shows, the amount of radiation passed in the two cases is different. However, the introduction of water droplets does not change the character of the vapour absorption bands, and the absorption in the centre of vapour absorption bands is the same as that in the

Card 5/9 centre of liquid absorption bands - confirming the conclusions

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made above. The amount of absorption depends not only on the mass of substance present but also on the particle dimensions. In the case of Rayleigh scattering the optical density is given by Eq.(2), where $h_э = VN\ell$ is the thickness of the equivalent continuous layer; m is the complex refractive index; n is the real part of the refractive index; χ is the absorption coefficient; V is the particle volume; N is the particle concentration and ℓ is the thickness of the aerosol layer. The optical density for one scattering is given by Eq.(3). The optical density for radiation absorption in an aerosol layer is given by Eq.(2) - Eq.(3) = Eq.(4). On the other hand, the optical density of a continuous layer of water of thickness h_B is given by Eq.(5) - where α^* is the absorption coefficient for a continuous layer. The ratio between the absorption in an aerosol layer of equivalent thickness $h_э$ and the absorption in a film of thickness h_B ($= h_э$) is given by Eq.(6). The second term in Eq.(6)

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(the scattering correction) is small, although it grows quickly ($\sim d^2$) as the particle dimensions increase for a given mass of substance. At intermediate dimensions the corresponding relationship is complicated, whilst for large particles the absorption is determined by the optical density:

$T = 2\pi a^2 N l = \frac{3}{d} h_э$. The ratio of absorption in a continuous layer to that in an aerosol of similar equivalent thickness is given by Eq.(7). For small diameters Eq.(7) is limited by the wavelength, for large diameters by the equivalent thickness of the layer. The amount of radiation absorbed in a layer of mist depends on the dimensions of the drops. To show this a table is given of the experimental and calculated values for wavelengths $\lambda = 2.94\ \mu$ ($\alpha^* = 7300\ cm^{-1}$) and $\lambda = 3.95\ \mu$ ($\alpha = 76\ cm^{-1}$) . The mean square dimensions of the particles investigated were about 10 μ. T_B corresponds to the optical density of a water film of width equal to the width of the equivalent continuous layer of aerosol ($h_э$); T_p defines the optical density of the mist, with one

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scattering, calculated from the Stratton-Hutton relationship; T is the optical density based on the absorption of radiation in a mist layer, T^* is the corresponding experimentally determined quantity. From column 7 for large absorption coefficients (α^*), $\frac{T_B}{T^*} > 1$ and equal to about 1.7 whilst for small $\alpha^* T_B/T^* \sim 0.017$. The corresponding T_p/T^* are 0.696 and 0.680. The ratio T/T^* for $\lambda = 2.94$ is, on the average, equal to 2.38, whilst in the region $\lambda = 3.95\ \mu$ it coincides with T_p/T^* . Thus the absorption of radiation by a layer of a dispersive medium cannot be calculated from a cloud layer by the equivalent continuous layer using the mass absorption coefficient (α^*) except at small values of $\rho = \pi d/\lambda$. This confirms the conclusions of K.S. Shifrin (Ref.4). For particles larger than the wavelength, the amount of energy absorbed depends on the dimensions and the absorption

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cannot be defined whilst working in regions of the basic vibrational frequencies of the water molecule. On the other hand, absorption in the vapour phase is not changed by the presence of a limited number of drops and an optical method of measuring the humidity can be used. The author thanks Ye. K. Fedorov and L. M. Levin for their advice. There are 5 figures, 1 table and 4 Soviet references.

ASSOCIATION: Akademiya nauk SSSR, Institut prikladnoy geofiziki (Academy of Sciences, USSR, Institute of Applied Geophysics).

SUBMITTED: June 22, 1957.

1. Infrared research--USSR 2. Infrared waves--Absorption 3. Water vapor--Absorptive properties 4. Spectrum analyzers--Applications 5. Cloud chambers--Applications

Card 9/9

SOV/49-58-7-12/16

AUTHORS: Rocharov, Ye.I. and Krutikov, A.S.

TITLE: Absorption of Radiation in Liquid Water (Pogloshcheniye radiatsii v zhidkoy vode)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, pp 923 - 926 (USSR)

ABSTRACT: The absorption of radiation in liquid water has been studied by several authors (Refs 1-3) but the data obtained (Ref 4) vary considerably - the centres of the absorption bands differ by 0.1 - 0.2 μ (equal to the displacement between liquid water and water vapour bands). The absorption coefficients obtained also vary, e.g. for the band from 2.7 - 3.0 μ , Ref 5 gives α = 2 733 cm^{-1} and Ref 6 gives α = 7 330 cm^{-1} . The present work was undertaken to try and obtain greater accuracy.
An infra-red (Perkin and Elmer) spectrometer was used with a thermo-element as radiation receiver and a potentiometer recorder. It was calibrated against a mercury arc. A water cell could be placed in front of the spectrometer with insertions giving a thickness (to 2-5% accuracy) of 0.025, 0.051, 0.100, 0.152, 0.203, 0.254, 0.304 and 0.406 mm. Distilled water was used.

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In the wavelength region 1.44 and 1.96 μ , a Lif prism was employed - Figures 1 and 2 show the absorption bands for liquid water in this region (wavelength in microns against absorption coefficient in cm^{-1}). Table 1 gives values for the absorption coefficient at various wavelengths as obtained for a spacer of thickness 0.100 mm in various experiments. Variations in thickness and parallelism of the cell sides increases the error by 1.5-2.0%. Values obtained are compared in Table 2 with those of other authors. The centres of the absorption bands are found from the measurements to lie at $\lambda_1 = 1.44 \pm 0.02$ μ ; $\lambda_2 = 1.96 \pm 0.02$ μ . The absorption coefficients, α , in the centre of the absorption bands are found to be: $\alpha_1 = 29.5$ cm^{-1} and $\alpha_2 = 130.6$ cm^{-1} with an error $< 7\%$. Measurements of the band at $\lambda = 2.94$ μ are very difficult owing to the very small thicknesses of water required. The method used was to compress a water drop between two sheets of glass: the thickness of the drop

being determined from the area covered and its weight (the error in these measurements varied from 8-38%). A NaCl prism was used. The absorption band for $\lambda = 2.94\ \mu$, for various thicknesses of water, is given in Figures 3 and 4 (wavelength in microns against emergent intensity in arbitrary units) 0-0 denotes the zero lines. The thicknesses of the water layers were 0.4, 0.8, 1.40, 2.25 and 25 μ. The average value for the absorption coefficient obtained was 6 700 cm^{-1} with an error $< 40\%$; the centre of the band was at $\lambda = 2.94 \pm 0.03\ \mu$. A LiF prism was used for measurements at $\lambda = 4.7\ \mu$ with water thicknesses of 0.025 and 0.051 mm. Figure 5 shows the absorption band in this region - the absorption coefficient at the centre is 472 cm^{-1} and the band centre lies at $\lambda = 4.72 \pm 0.04\ \mu$.

A water cell of variable thickness was constructed as depicted in Figure 6. A cylinder 2 rotates on a threaded sleeve 3 in which a window 10 is fastened by a retainer 6. The liquid is poured in through 8. The cylinder 4 is connected with 3 by means of 7. Thus, they rotate together and the window remains stationary, relative to them.

Absorption of Radiation in Liquid Water SOV/49-58-7-12/16

The accuracy is increased by the fact that the sleeves have different threads, e.g. 0.7 and 0.75 mm, so that one rotation advances the window by 50 μ. The error in measuring the thickness of the liquid layer is about 1-2 μ, so that for a layer 0.1 mm thick, the error does not exceed 1.5%.
There are 6 figures, 2 tables and 7 references, 4 of which are Soviet and 3 English.

ASSOCIATION: Akademiya nauk SSSR, Institut prikladnoy geofiziki (Ac.Sc.USSR Institute of Applied Geophysics)

SUBMITTED: June 22, 1957

Card4/4

1. Radiation--Absorption 2. Water--Absorptive properties
3. Infrared spectrophotometers--Applications

AUTHOR: Bocharov, Ye. I. SOV/49-59-1-21/23

TITLE: Absorption of Radiation in Humid Air. Optical Hygrometer (Pogloshcheniye radiatsii vlazhnym vozdukhom. Opticheskiy gigrometr)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1959, Nr 1, pp 162-169 (USSR)

ABSTRACT: The problem of spectroscopic determination of radiation in aqueous vapour is discussed in this work. Laboratory tests were carried out by means of the apparatus shown in Fig.1. It consists of a radiation source (spiral 1) enclosed in a water-cooled chamber. The radiation waves are passing through a window made of CaF_2 and after being reflected by a concave mirror 2 enter a tube 3 as a parallel beam. This beam is collected by a second concave mirror 4 and sent to a spectrometer passing again through a window 5 made of CaF_2. The length of the tube could be varied from 1 to 3 m so that the length of the whole vessel (tube and chambers) could be 1.6, 2.6 and 3.6 m. The degree of humidity in the vessel can be regulated by the cylinders C containing water solutions of various

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Absorption of Radiation in Humid Air. Optical Hygrometer.

salts. The pressure of the saturated aqueous vapour was taken from tables. The temperature was kept constant at 20°C (± 0.5°C). The purpose of the experiments was to determine the transparency of the humid air for the wave length $\lambda = 2.7$ and $\lambda = 6.28$ μ. The results are shown in Table 1 (width of spectral slit 0.15 mm and $\Delta\lambda = 0.077$ μ) and Table 2 (0.3 mm, $\Delta\lambda = 0.143$ μ) where the columns 1 to 12 denote the following:

1) Salt used for the experimentations,
2) Relative humidity, %,
3) Absolute humidity, g/m^3,
4) Length of the vessel, m,
5) Atmospheric pressure, mm Hg,
6) I_o, intensity of radiation of the wave $\lambda = 2.7$ μ in dry air,
7) I_o and I (I - as above but in humid air),
8) $1-(I/I_o)$,

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9) Sn, absorbed energy defined on the spectrogram by means of a planometer,

10) A, %, A_2 = Sn/So % (So - energy of radiation)
11) α_μ, cm^2/g, coefficient of absorption,
12) Mass of vapour $g/cm^2 \times 10^4$.

Fig.2 shows the absorption as a function of the absolute and relative humidities for the wavelength 2.7 μ. The curves 1 to 3 show the absorption in the centre of the band I_o-I and the curve 4 - absorption in the whole band Sn. Usually the value of I_A is calculated from Eq.(1). However, the absorption of radiation in the humid air cannot be expressed as an exponential function, as can be seen in Fig.3, where the relation of the coefficient of absorption to the mass of aqueous vapour is shown (1 - length of the base, 1.6 m, 2 - 2.6 m). Fig.4 shows the relationship of the function of absorption A (Eq.2) to the square root of this mass. For small amounts of vapour, this function can be expressed as Eq.(3), where A - relative error of the determination of the mass of vapour under the effect of radiation is calculated from Eq.(4). An optical hygrometer could be constructed to read the value $P = S/S_o$ (S_o - energy of

Absorption of Radiation in Humid Air, Optical Hygrometer.

spectral band $\Delta\lambda$ in dry air of thickness ℓ, S_0 - in humid air). The relative error in this case could be calculated from Eq.(5) and Fig.5. In practice this error could be taken as Eq.(6) when the dial has 100 divisions or Eq.(8) - 1000 divisions. The length of the air base could be determined from Eq.(7) (in cm). The value of S/S_0 which determines the size of the apparatus will decrease together with the spectral width of the radiation band. The character of this radiation is shown in Fig.6. One of the many possible designs of an optical hygrometer is shown in Fig.7. Here the distance ℓ can be calculated as equal to 1 to 1.5 m, the source of radiation is placed in the chamber 3 ($L_{1,2,3,4}$ - lenses, $F_{1,2}$ - filters, $M_{1,2,3,4}$ - mirrors, 4 - receiving indicator). Acknowledgments are made to Ye. K. Fedorov for his assistance.

There are 7 figures, 2 tables and 6 references, 3 of which are Soviet, 3 English.

ASSOCIATION: Akademiya nauk SSSR, Institut prikladnoy geofiziki (Ac.Sc. USSR Institute of Applied Geophysics)

SUBMITTED: June 22, 1957

PICHUGIN, A.A., dotsent, kand.tekhn.nauk; BOCHAROV, Ye.V., inzh.. Prinimali uchastiye: KUZ'MINSKIY, A.G., inzh.; VORONKINA, M.A., inzh.; FEDOROV, A.A., inzh.;BELOUSOV, M.A., inzh.ekonomist; PROSVIRNIN, G.V., inzh.; KNIGINA, G.I., dotsent, kand.tekhn.nauk; LESNIKOV, V.V., dotsent, kand.tekhn.nauk; SIDOROV, A.K., dotsent, kand. arkhitektury; KARTASHOV, A.A., arkhitektor; BARITSKIY, F.F., dotsent, kand.tekhn.nauk; KULISHOV, D.A., prof.; ZDESENKO, G.M., kand.tekhn. nauk; ALEKSANDRENKO, A.I., dotsent, kand.tekhn.nauk; STREL'NIKOV, G.Ye., kand.tekhn.nauk; VANEYEV, V.A., assistent; CHEREPKO, P.A., dotsent. SUSHINSKIKH, A.F., inzh., retsenzent; MEN'SHIKOV, P.N., red.; SUBBOTINA, G.M., tekhn.red.

[Manual for rural builders] Spravochnik proizvoditelia rabot sel'skokhoziaistvennogo stroitel'stva. Novosibirsk, Novosibirskoe knizhnoe izd-vo. Vol.1. 1959. 673 p. Vol.2. 1959. 677-1191 p. (MIRA 13:2)

(Farm buildings)

42687
S/747/62/000/000/008/025
D268/D307

27 1220

AUTHORS: Bocharov, Yu. S., Bocharov, Ye. V. and Mikheyeva, G. A.

TITLE: The comparative radiosensitivity of ovaries in monkeys (Macaca mulatta) and mice under x ray irradiation

SOURCE: Radiatsionnaya genetika; sbornik rabot. Otd. biol. nauk AN SSSR. Moscow, Izd-vo AN SSSR, 1962, 98-109

TEXT: Radiosensitivity was studied in ovarian follicles in 46 white mice (Kunminskaya line), old females being used to show minimal sensitivity, and 17 monkeys (two 2-year olds, and the rest 4 - 8 years), with mouse ovaries irradiated locally at 25, 50 and 100 r and 1 ovary per monkey at 50 and 100 r. Only follicles with clear indications of atresia were taken as moribund. X rays at 50 and 100 r had pronounced sterilizing effects on mice, primordial follicles being especially sensitive, some being damaged even at 25 r. There was sterilization at 24 hours and most damaged follicles were resorbed at the 30th day. In monkeys, ovarian follicles were unaffected at 50 r, the minimal dose being 100 r. At this

Card 1/2

BOCHAROV, Yu.

BOGUSLAVSKIY, I.: BOCHAROV, Yu., nauchnyy sotrudnik.

Method for establishing work norms in the repair of open-hearth furnaces. Sots.trud.no.11:86-90 N '56. (MLRA 10:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut ogneuporov chermet.
(Steel industry--Production, Standards)
(Furnaces)

Bocharov, Yu.

BOGUSLAVSKIY, I.; BOCHAROV, Yu.; YENTOV, O.

Method for developing increased norms. Sots.trud no.9:89-93 S '57. (MIRA 10:9)
(Machinery industry--Production standards)

BOCHAROV, Yu., arkhitektor; MARKUS, B., arkhitektor; TAZHIYEVA, L., arkhitektor; BORUNOV, S., inzh.

Development of the structure of an industrial city. Eksper. proekt. no.5:77-87 '62. (MIRA 18:9)

BOCHAROV, Yu., arkhitektor; NUDEL'MAN, V., arkhitektor; PREZINSKAYA, N., arkhitektor

Development of the city structure in the group form of settlement. Eksper. proekt. no.5:88-96 '62. (MIRA 18:9)

ZIMIN, A.I.; BOCHAROV, Yu.A.

Hydraulic screw-press hammer. Kuz.-shtam. proizv. 1 no.8:15-17 Ag '59. (MIRA 12:12)
(Forging machinery)

Bocharov, Yu A.

PHASE I BOOK EXPLOITATION SOV/3955

Moscow. Vyssheye tekhnicheskoye uchilishche

Mashiny i tekhnologiya obrabotki metallov davleniyem; sbornik statey (Machinery and Processes for the Pressworking of Metals; Collection of Articles) Moscow, Mashgiz, 1960. 246 p. (Series: Its: Trudy, vyp. 98) Errata slip inserted. 3,500 copies printed.

Ed.: A.I. Zimin, Doctor of Technical Sciences, Professor; Ed. of Publishing House: O.V. Chernyak; Tech. Ed.: T.F. Sokolova; Managing Ed. for Literature on Heavy Machine Manufacturing (Mashgiz): S.Ya. Golovin, Engineer.

PURPOSE: This collection of articles is intended for workers in scientific research institutions and in die-forging shops, and for engineering students.

COVERAGE: The book contains papers from the Department of Machines and Processes for the Pressworking of Metals of the MVTU (Moscow Higher Technical School imeni N.E. Bauman). The papers deal with

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theoretical and practical aspects of metal pressworking and with the theory and practice of forging machine and press design. These papers deal with machine hydraulics (selection of drives of presses, pressure in cylinders). A design of a hydraulic power-screw type "press-hammer", which can work as a percussion press or forging press, is presented. Problems of the theory of plastic deformation in forging, upsetting, and forming are also analyzed. 17 reference cards (Nos. 33 to 49) are appended to explain problems pertaining to the state of stress of plastically deformed metal. These cards are the continuation of cards presented in collection No. 79 of the MVTU, 1957. No personalities are mentioned. References accompany most of the articles.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress

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VK/rem/jb
7-27-60

85664

1.1400 2308, 1413, 1454

S/182/60/000/007/006/016
A162/A029

AUTHOR: Bocharov, Yu.A.

TITLE: Experimental Investigation of a Hydraulic-Screw Hammer-Press

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 7, pp. 22 - 27

TEXT: The principle of this new machine designed by Professor A.I. Zimin, has been described (Ref. 1 "Kuznechno-shtampovochnoye proizvodstvo", No. 8, 1959). This article contains a detailed description of tests of a machine model shown in a photo (Fig. 2) built at the mechanical workshops of the MVTU. The machine has a screw cylinder (shown in photo). The oil feed from a pistonless accumulator is controlled by a three-position slide valve. The mobile system of the machine is illustrated in a diagram (Fig. 1) and a detailed drawing (Fig. 3) of the screw cylinder with the piston and the slide-block. The press has a nominal 25-ton pressure, its maximum fluid pressure being 200kg/cm^2. Detailed information concerning the tests is included. The machine developed a 9.17 to 13 times higher kinetic energy per kilogram of the mobile parts than it is normal for unrestricted dropping, i.e. considerably exceeding the maximum energy of mobile parts achieved in the existing forging machines working by kinetic energy. Even the

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S/182/60/000/007/006/016
A162/A029

Experimental Investigation of a Hydraulic-Screw Hammer-Press

first experimental unit built in workshops not suitable for production of such machines is on par with modern forging presses. The development of this new press type will go on. A second hydraulic-screw press with a 25-ton effort is under construction at the MVTU, and the first semi-automatic 250-ton press with screw thread inside the hydraulic cylinder will be built before the end of 1960 at a (not named) plant. There are 8 figures, 4 tables and 4 Soviet references.

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Experimental Investigation of a Hydraulic-Screw Hammer-Press

Figure 1:

1. Mechanical and Hydraulic Digrams of a Press-Hammer. 1-screw cylinder; 2-plunger; 3-nut; 4-slide; 5-electric motor; 6-pump; 7-discharge and protective valve; 8-balloon with compressed nitrogen; 9-accumulator; 10-float for storage cell control; 11-distribution slide valve; 12-reverse valves; 13--pressure gauges.

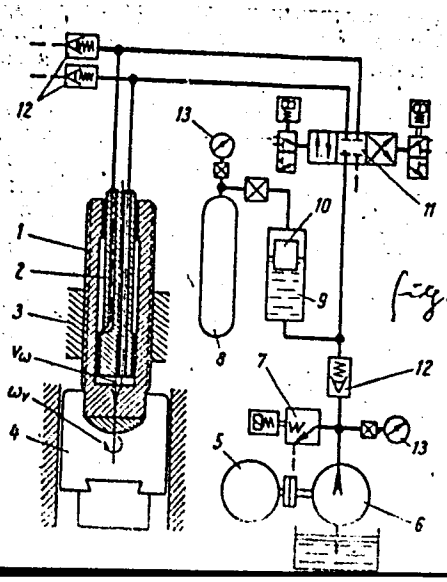

Fig. 1

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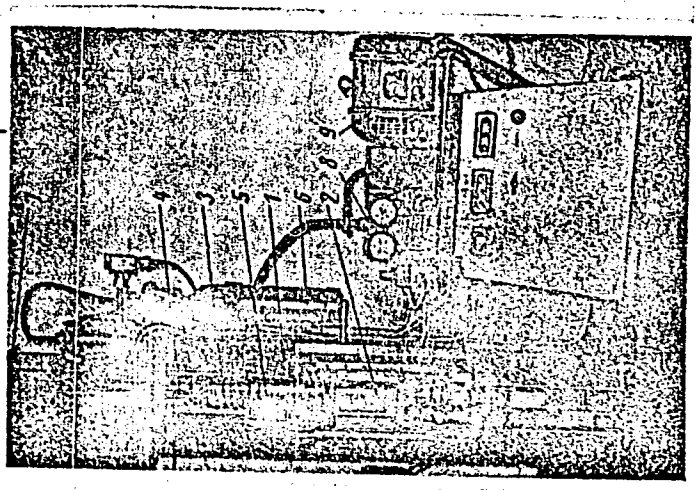
Experimental Investigation of a Hydraulic-Screw Hammer-Press

Figure 2:

General View of an Experimental Hydraulic-Screw Press-Hammer: 1-stand; 2-slide; 3-screw cylinder; 4-plunger; 5-nut; a-accumulator; 7-reservoir; 8-pump; 9-electric motor.



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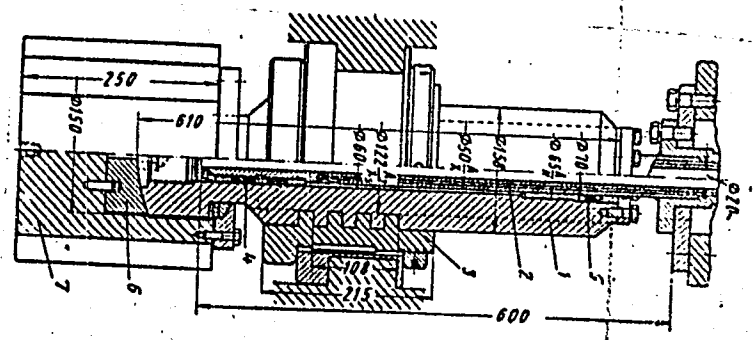
A162/A029

Experimental Investigation of a Hydraulic-Screw Hammer-Press

Figure 3:

Design of the Mobile Parts of the Press-Hammer: 1--screw cylinder; 2-plunger; 3-nut; 4-piston with packings; 5-packing of the rod; 6-footstep bearing; 7-slide.



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S/122/60/000/004/004/014
A161/A130

AUTHOR: Bocharov, Yu.A., Engineer

TITLE: Hydraulic seal cup packings tested with helical nutual motion of sealed surfaces

PERIODICAL: Vestnik mashinostroyeniya, no. 4, 1960, 26 - 29

TEXT: The purpose of described experiments at MVTU im. Baumana (MVTU im. Bauman) was to study the behavior of hydraulic seal packings in cylinders with rotary piston, i.e., performing straight motion in combination with rotation. The packings used for tests were of machine tool industry standard type and made in accordance with new draft standard developed at TsNIITMASh. A special test device was produced and used on a crank press. The device had a screw being connected to the piston with the seal packings on. The cylinder was mounted on ball bearings excluding the effect of any forces except the friction on the seal packings. The work fluid was spindle oil; the test pressures were between 0 and 250 kg/cm^2. The forces and friction moments were recorded with an electromagnetic МПО -2 (MPO-2) oscillograph connected with a four-channel amplifier of Zavod imeni 800-letiya Moskvy (Plant imeni "800th Anniversary of Moscow"). The packing

Hydraulic seal cup packings ...

material was "A1" rubber and rubberized fabric called "domestik". The observations confirmed the statement made by Professor T.M. Bashta [Ref. 1: Samoletnyye gidravlicheskiye privody i agregaty (Hydraulic aircraft drives and engines), Oborongiz, 1954] that mashining traces direction on surfaces has a stronger effect on friction than their depth. The sliding friction factor variations with changing work fluid pressure were determined using a method suggested by I.V. Makarov (Ref. 4: O trenii manzhet "Stanki i instrumant", no. 12, 1955), by the formula

$$f_p = \frac{T}{\pi d b (q_\mu - q_\rho)},$$

where f_p is the friction factor for the seal material at certain pressure; T - the resultant friction force measured at same work fluid pressure; d - the friction surface diameter of the seal packing; b - the contact surface width of the packing; q_μ - the normal contact pressure on sliding surface produced by preload of packing at assembly; q_ρ - the normal contact pressure on sliding surface produced by hydraulic pressure of work fluid, $q_\rho = \frac{\mu p}{1 - \mu}$ (where μ is the transverse deformation module; for the rubber compounds used for such cup packings $\mu = 0.3 \div 0.45$, and for "domestik" $\mu = 0.3$). The friction factor for

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Hydraulic seal cup packings ...

packing material can be determined roughly approximately from manuals and then more accurately for the given fluid pressure, using the formula:

$$q_K = \frac{T}{\pi d b f_o}.$$

Friction factors for the tested materials at v = 60 cm/sec and different helix angles calculated by this method are shown (Fig. 6). The friction factor of "A1" rubber packings varied only slightly with changing angle between the piston displacement and the machining tool trace lines, but with "domestik" packings it changed abruptly. Wear measurements were not conducted. The conclusion was made that standard seal packings can be used. It is recommended to employ I.V. Makarov's (Ref. 4) equations for approximate calculations and substitute friction factors being close to the expected service conditions for the seal being calculated. There are 6 figures and 5 Soviet-bloc references.

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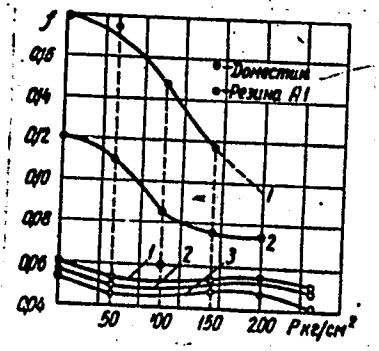
Fig. 6: Measured values of friction factor on steel cylinder at different fluid pressure and motion helix angle. Two upper curves with solid dots are for "domestik", three bottom curves for "A1" rubber. 1 - α = 14°; 2 - α = 20°; 3 - α = 30°.



Card 4/4

BOCHAROV, Yu. A., Cand Tech Sci -- "Theoretical and experimental study of a new type of forging machine, the hydroscrew press - hammer." Mos, 1961. (Min of Higher and Sec Spec Ed RSFSR. Mos Automech Inst) (KL, 8-61, 241)

BOCHAROV, Yu.A.

Using pressure transmitters in the testing of hydraulic presses. Kuz.-shtam.proizv. 5 no.8:29-30 Ag '63. (MIRA 16:9)

BOCHAROV, Yu.A., kand.tekhn.nauk,dotsent

Dynamics of a hydraulic-screw hammer press. Trudy MVTU no.111: 56-70 '64.

Power production and efficiency of hydraulic screw hammer presses. Ibid.:71-82 (MIRA 17:9)

BELYAYEV, S.N., inzh; BOCHAROV, Yu.A., kand.tekhn.nauk,dotsent

Floating level regulator for a hydropneumatic microaccumulator.
Trudy MVTU no.111:83-89 '64. (MIRA 17:9)

L 36128-66 EWT(m)/EWP(k)/EWP(t)/ETI IJP(c) JD/HW

ACC NR: AP6016575 (A) SOURCE CODE: UR/0182/66/000/005/0001/0007

AUTHOR: Popov, Ye. A.; Bocharov, Yu. A.; Polyak, S.M.; Stolbunov, A. S.; Raykh, D. B.; Legchilin, A. A.

ORG: none

TITLE: Metal forming by means of a pulsed magnetic field. Part. 1. Nature of process and equipment

SOURCE: Kuznechno-shtampovochnoye proizvodstvo, no. 5, 1966, 1-7

TOPIC TAGS: pulsed magnetic field, metal forming, die, electric energy conversion

ABSTRACT: Metal forming by means of a pulsed magnetic field (PMF) is based on the conversion of the electric energy accumulated in the storage element during discharge via an inductor, to the energy of a pulsed magnetic field which creates the pressure shaping the metal blank. In this connection, the authors present formulas for determining the electric and magnetic parameters of the process. It is shown that the efficiency of PMF used in the forming of sheet metal ranges from 10 to 40%. There exist several techniques of PMF metal forming, as illustrated in Fig. 1: a) reduction of tube diameter by means of an inductor surrounding the tube (Fig. 1, a); b,c) flaring of the tube end by means of an inductor located within the tube (Fig. 1, b) with placement of die outside the tube in order to prevent the flaring of the remainder of

UDC: 621.7.044

Card 1/3

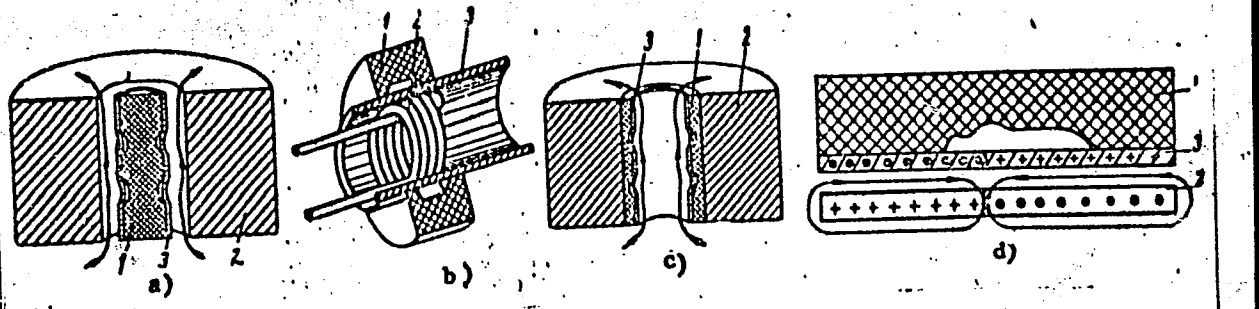


Fig. 1. Techniques of metal forming by means of PMF

1 - die (mandrel); 2 - inductor; 3 - blank

the tube after the field reaches a certain value (Fig. 1, c); d) sheet-metal forming by means of flat inductors (Fig. 1, d). In addition, PMF devices employing flat inductors may be used to blank and pierce metals, to assemble permanent connections, to

straighten plane and curved surfaces, and to shape metal located within a chamber, housing or shell consisting of dielectric materials. These devices consist of five principal components: charger (high-voltage rectifier), power storage element (capacitor banks), discharger-switch (arc discharger), igniter (thyratron), and forming element (working inductor and die or mandrel along with attachments for clamping the blank). The specifications of a Soviet-built PMF metal-forming installation, include: supply voltage, 230 v; mean discharge current, 15 a; maximal energy stored in capacitor bank, 7.2 kilo-joules; maximum electromagnetic pressure exerted on blank, 6400 kg/cm^2; time per cycle, 2 min; pulse time (half-period time), (40-50) 10^{-6} sec; maximum diameter of blank, 140 mm; dimensions of PMF installation, 1200x700x1500 mm. The second part of this investigation, which describes the mechanism of plastic deformation by means of PMF, will be published in the next issue of the same journal. Orig. art. has: 10 figures, 21 formulas.

SUB CODE: 13,20,11,09/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 001/

L 05253-67 FSS-2/EWT(1)/EWP(t)/ETI/EWP(k) IJP(c) JGS/JD/HW
ACC NR: AP6028389 SOURCE CODE: UR/0182/66/000/006/0002/0009

AUTHOR: Popov, Ye. A.; Bocharov, Yu. A.; Polyak, S. M.; Stolbunov, A. S.; Raykh, D. B.; Legchilin, A. I.

60
59

ORG: none

TITLE: Deformation of metal by a pulsed magnetic field. Part II. Features of the mechanism of deformation of a blank in a pulsed magnetic field

SOURCE: Kuznechno-shtampovochnoye proizvodstvo, no. 6, 1966, 2-9

TOPIC TAGS: high speed cine camera, capacitor, pulsed magnetic field, metal deformation/SFR-2M high-speed cine camera, IM-5-150 capacitor

ABSTRACT: The pulsed, intermittent nature of the application of the magnetic field causes the forces of inertia to affect greatly the process of deformation and, in particular to cause plastic deformations in the blank after the load is no longer applied. Hence the process of deformation by means of a pulsed magnetic field (PMF) may be separated into an active and a passive stage. To elucidate the mechanism of PMF deformation and the features of the kinematics of change in shape of the billet, this process was investigated with the aid of a SFR-2M

Card 1/3 UDC: 621.7.044

L 08983-67
ACC NR: AP6028389

0

cessary to further investigate the possibilities of this new forming technique. Orig. art. has: 9 figures, 5 formulas

SUB CODE: 11,20,14/ SUBM DATE: none/ ORIG REF: 002

Card 3/3 nst

BOCHAROV, Yu.D., master kompleksnoy brigady; STEPANOVICH, M.G., master kompleksnoy brigady; GUBIN, V.N., inzh.

How we organized periodic repair of electric locomotives. Elek. i tepl. tiaga 4 no.11:1-6 N '60. (MIRA 13:12)
(Electric locomotives—Repairing)

BOCHAROV, Yu. G.

BOGUSLAVSKIY, I.Ya., starshiy nauchnyy sotrudnik,; BOCHAROV, Yu. G., mladshiy nauchnyy sotrudnik,; YENTOV, O.I., mladshiy nauchnyy sotrudnik,; ZHIVAGO, V.I., mladshiy nauchnyy sotrudnik,; KHITSUN, V.N., inzh.; BUBLIK, V.I., inzh.; LEVCHENKO, D.V., otv. red.; AVKUTSKAYA, R.F., red. izd-va,; MIKHAYLOVA, V.V., tekhn. red.; EVENSON, I.M., tekhn. red.

[Consolidated time norms for machining standard parts; unit and small-scale production] Ukrupnennye normy vremeni na tokarnuiu obrabotku tipovykh detalei; individual'noe i melkoseriinoe proizvodstvo. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi tsvetnoi metallurgii, 1958. 445 p. (MIRA 11:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut organizatsii proizvodstva i truda chernoy metallurgii.
(Turning--Production standards)
(Time study)

BOGUSLAVSKIY, Isaak Yakovlevich; BOCHAROV, Yuriy Grigor'yevich; LEVCHENKO, Dmitriy Vasil'yevich; PORTNOY, Moisey Yevseyevich; MERKOV, S.M., red.; AVRUTSKAYA, R.F., red.izd-va; ISLENT'YEVA, P.G., tekhn.red.

[Establishing norms and the work organization for the repair of metallurgical furnaces] Tekhnicheskoe normirovanie i organizatsiia truda na remontakh metallurgicheskikh pechei. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1960. 316 p. (MIRA 13:10)

(Metallurgical furnaces--Maintenance and repair)

BOGUSLAVSKIY, I.Ya., starshiy nauchnyy sotrudnik; BOCHAROV, Yu.G., mladshiy nauchnyy sotrudnik; YENTOV, O.I., mladshiy nauchnyy sotrudnik; BUBLIK, V.I., inzh.; GOLOVANOVA, I.N., inzh.; KHITSUN, V.N., inzh.; SEMENENKO V.I., inzh.; SHMEDRIK, S.S., inzh.; LEVCHENKO, D.V., otv.red.; CHETYRKIN, M.I., red.; PINEGIN, I.I., red.izd-va; ISLENT'YEVA, P.G., tekhn.red.

[Enlarged machining and time norms for planing and slotting; piece and small lot production] Ukrupnennye normy i normativy vremeni na strogal'nye i dolbezhnye raboty; individual'noe i melkoseriinoe proizvodstvo. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1961. 408 p. (MIRA 14:12)

1. Kharkov. Vsesoyuznyy nauchno-issledovatel'skiy institut organizatsii proizvodstva i truda chernoy metallurgii.
(Metal cutting)

BOGUSLAVSKIY, I.Ya., starshiy nauchnyy sotr.; BOCHAROV, Yu.G., mlad. nauchnyy sotr.; YENTOV, O.I., mlad. naychnyy sotr.; BUBLIK, V.I., inzh.; GOLOVANOVA, I.N., inzh.; KHITSUN, V.N., inzh.; SEMENENKO, V.I., inzh.; SHMEDRIK, S.S., inzh.; LEVCHENKO, D.V., otv. red.; BURSHTEYN, A.I., red. izd-va; ISLENT'YEVA, P.G., tekhn. red.

[Consolidated norms and time norms for boring work; piece and small lot production] Ukrupnennye normy i normativy vremeni na rastochnye raboty; individual'noe i melkoseriinoe proizvodstvo. Moskva, Metallurgizdat, 1962. 407 p. (MIRA 15:3)

1. Kharkov. Vsesoyuznyy nauchno-issledovatel'skiy institut organizatsii proizvodstva i truda chernoy metallurgii.
(Drilling and boring--Production standards)

Bocharov Yu I

SABININ, Yu.A., kand.tekhn.nauk; BOCHAROV, Yu.I., inzh.; ZABOROVSKIY, S.A., inzh.; ZVYAGIN, I.Ye.; inzh.; KULIKOV, S.N., inzh.; POPOV, O.V., inzh.

A motor drive with wide-range smooth speed control. Elektrichestvo no.12:20-23 D '57. (MIRA 10:12)

1.Leningradskiy politekhnicheskiy institut im. Kalinina.
(Electric driving)

S/137/61/000/007/030/072
A060/A101

AUTHORS: Shaptala, A. Ya; Bocharov, Yu. I.; Marakasov, I. Kh.

TITLE: Automatic regulation of band thickness on reversible twelve-roll mills

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1961, 10, abstract 7D72 ("Nauchno-tekhn. inform. byul. Leningr. politekhn. in-t", 1960, no. 8, 79-86)

TEXT: The described scheme for automatic regulation of band thickness provides for control by varying the back tension for deviations in band thickness of ± 5 - 6μ and above these values by a clamping device. It is shown that by the action of two servo-systems upon the thickness variations of the band it is possible to obtain a maximum deviation in band thickness of ± 6 - 7μ for a prescribed value of ± 10μ. The possible ways of obtaining still smaller thickness deviations are considered.

V. Pospekhov

[Abstracter's note: Complete translation]

Card 1/1

S/194/61/000/008/016/092
D201/D304

9,2530

AUTHORS: Bocharov, Yu.I. and Sharakhin, V.N.

TITLE: Selecting the method of calculating magnetic amplifier characteristics

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 8, 1961, 9, abstract 8 V82 (Nauchno-tekhn. inform. byul. Leningr. politekhn. in-ta, 1960, no. 8, 66-72)

TEXT: Two methods are considered and analyzed of calculating and constructing characteristics of a feed-back magnetic amplifier: 1) Application of the family of steel characteristics with simultaneous magnetization, disregarding the feedback and using its circuitry for determining the dependence of the load current on the direction of control current; 2) Use of magn. characteristics constructed with the effect of positive feedback. The disadvantages of the first method are discussed, at the same time its simplicity

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Selecting the method...

and universality pointed out. The second method, more cumbersome, may be applied where more accurate characteristics of the magnetic amplifier have to be obtained. 6 figures. 3 references. [Abstracter's note: Complete translation]

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BOCHAROV, Yu.I.

Operation of a magnetic amplifier with different load forms. Trudy LPI 240:11-17 '64. (MIRA 17:11)

BOCHAROV, Yu.I.

Choice of a network for connecting magnetic amplifiers in a reversive electric drive. Trudy LPI 240:68-75 '64. (MIRA 17:11)

S/063/61/006/001/003/005
A051/A129

AUTHOR: Bocharov, Yu. N.

TITLE: Certain aspects of improving the technology in the production of phenol and acetone from cumene

PERIODICAL: Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva im. D. I. Mendeleyeva, v. 6, no. 1, 1961, 74-80

TEXT: In 1949 a multi-tonnage phenol-producing plant using the cumene method was put into operation in the USSR. The main advantage of this method is the simultaneous production of the by-product acetone, yielding 640 kg to 1 ton of phenol. The process of combined production of phenol and acetone is said to consist of the following main stages: 1) oxidation of cumene by air oxygen, yielding commercial hydrogen peroxide, 2) acid decomposition of hydrogene peroxide to phenol and acetone, 3) separation of the decomposition products, yielding phenol and acetone, 4) separation and processing of by-products of the process. The high consumption of benzene and isopropylbenzene in the production of phenol and acetone is due to the formation of a large amount of by-products during the process of cumene oxidation and decom-

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position of hydrogen peroxide, the presence of by-products and harmful admixtures in the initial substances and the imperfection of some of the technological units. Conditioning units for propane-propylene are suggested in order to provide propane-propylene fractions of required purity. At 15% oxidation depth there are hardly any decomposition products present. Workers of the Novokuybyshevsk Branch of Giprokauchuk showed that the oxidation process was useful as a measure in phenol-acetone production. Other laboratory data [B. I. Trubina - Ref. 17: Razlozheniye gidroperekisi izopropilbenzola v srede atsetona (Decomposition of Hydrogen Peroxide of Isopropyl-Benzene in an Acetone Medium); Account of TsZL, 1959] proved the expediency of the decomposition process of hydrogen peroxide in an excess of acetone. Work on the neutralization of the decomposition mass on an AH-1 (AN-1) type anionite was carried out at the TsZL of a chemical plant [A. V. Chertorizhskiy, G. G. Goryachera - Ref. 15: Ispol'zovaniye anionnoobmennykh smol v proizvodstve fenola i atsetona (Utilization of Anion Exchange Resins in the Manufacture of Phenol and Acetone), Account of TsZL, 1958]. The anionite neutralization of the decomposition mass eliminates the possibility of sulfate salts and sodium phenolate entering the rectification system. The most important problem in the

Certain aspects of improving the...

production of phenol and acetone from cumene is considered to be the qualified use of the formed by-products and their conversion to phenol, α-methylstyrene or cumene. At the present time experiments are being conducted at the Institut goryuchikh iskopayemykh (Institute of Fuel Deposits) of the AS USSR on the hydration of phenol resin, diluting it with the α-methylstyrene fraction. Hydration is conducted on an industrial catalyst. Special attention is given to safety measures and industrial hygiene when designing new plants for phenol and acetone production. The use of circulating softened water for heat removal helps to avoid the formation of a residue on the internal surface of the spirals, increases the effectiveness of the heat removal and eliminates overheating of the oxidation-reaction mass. One of the plants is to install an oxidation unit for isopropylbenzene in an airlift-type apparatus. The further reduction of construction costs and specific overhead costs per ton of products is stressed. These steps are accomplished by: increasing production capacity to an optimum value, combining and compacting shops, increasing apparatus and decreasing the number of parallel-functioning units, removal of equipment out of the building, complete automation and mechanization of production processes. It is thought that these measures will help to reduce the consumption of isopropylbenzene per ton of

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Certain aspects of improving the...

phenol by 10 - 12% as against the present value. There are 6 tables, 5 flow-sheets and 19 references: 17 Soviet, 1 English, 1 German.

Figure 4

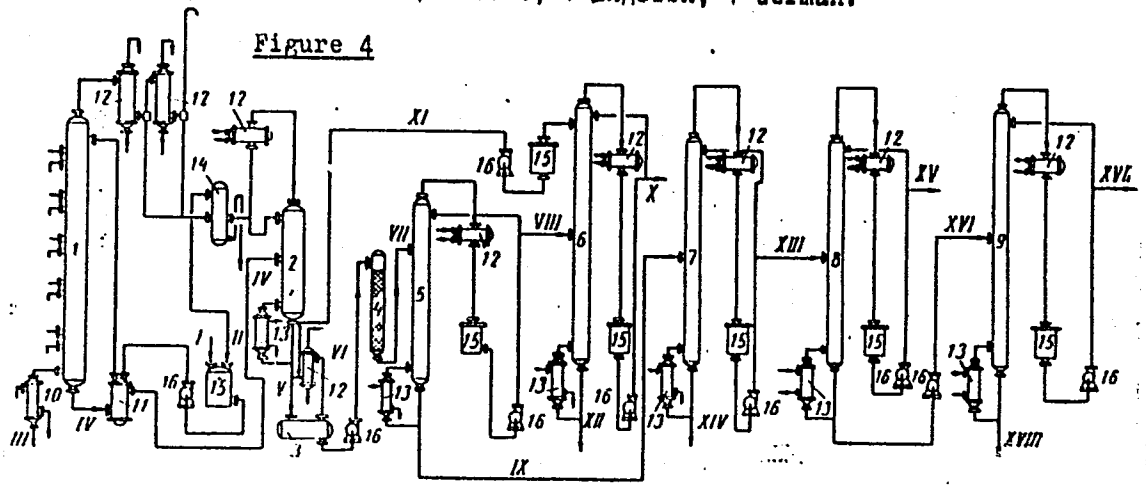

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Figure 4: (continued)

Technological diagram of phenol and acetone production for plants being designed:

1 - oxidation column, 2 - column of hydrogen peroxide concentration, 3 - decomposition apparatus, 4 - neutralizer, 5 - column of acetone raw material, 6 - column of commercial acetone, 7 - column of phenol distillate distillation, 8 - column of phenol raw material, 9 - column of commercial phenol, 10 - air heater, 11 - heater of the oxidizing batch, 12 - condensators, 13 - boilers, 14 - tanks, 15 - collectors, 16 - pumps.
I - fresh isopropylbenzene, II - reversible isopropylbenzene, III - air, IV - reaction mass of oxidation, V - concentration of hydrogen peroxide, VI - reaction mass of decomposition, VII - neutralized mass of decomposition, VIII - acetone raw material, IX - phenol fraction, X - commercial acetone, XI - side selection of acetone for concentration of the decomposition mass, XII - α-methylstyrene fraction for processing, XIII - phenol distillate, XIV - vat decoction for reprocessing, XV - α-methylstyrene fraction for reprocessing, XVI - phenol raw material, XVII - commercial phenol, XVIII - vat residue for reprocessing.

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Certain aspects of improving the...

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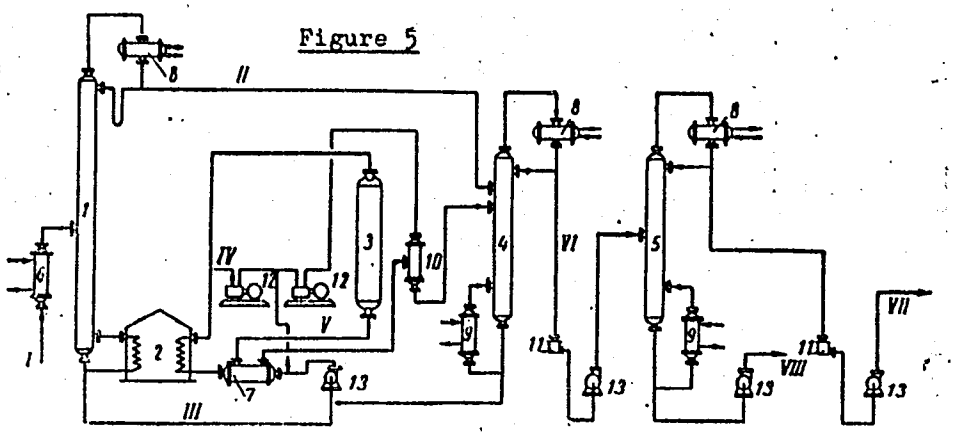
A051/A129

Figure 5



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Certain aspects of improving the...

Figure 5: (continued)

Technological diagram of phenol resin hydration:

1 - distillation column for the phenol distillate, 2 - tubular oven, 3 - contact machine, 4 - column of distillation of hydrogenizate, 5 - column of phenol raw material formation, 6 - heater, 7 - recuperator, 8 - condensators, 9 - boilers, 10 - separator, 11 - selectors, 12 - compressors, 13 - pumps. I - vat decoction, II - phenol distillate, III - phenol resin for hydration, IV - methane-hydrogen fraction, V - hydrogenizate, VI-phenol fraction, VII - hydrocarbon fraction for wahsing phenol and further processing, VIII - phenol raw material.

Card 7/7

BOCHAROV, Yu., arkhitektor (Moskva); SHTRASSENMAYYER, V. (Berlin, Germanskaya Demokraticheskaya Respublika)

More on constructing temporary and permanent roads in building residential blocks. Na stroi. Mosk. 1 no.10:28-29 O '58. (MIRA 11:12)

(Road construction)

BOCHAROV, Yu.P., arkhitektor.

Expansion of residential blocks and placing of servicing enterprises. Gor. khoz. Mosk. 32 no.7:30-31 Jl '58. (MIRA 11:6)
(Shopping centers)

BOCHAROV, Yuriy Petrovich, kand. arkhitektury; RUBANENKO, B.R., nauchnyy red.; CHURINOV, A.I., red. izd-va; PYRKINA, N.F., tekhn. red.

[Organizing the movement of pedestrians and transportation in microdistricts] Organizatsiia dvizheniia peshekhodov i transporta v mikroraionakh; voprosy planirovki. Moskva, Izd-vo M-va kommun. khoz. RSFSR, 1960. 65 p. (MIRA 14:10)

1. Deystvitel'nyy chlen Akademii stroitel'stva i arkhitektury SSSR (for Rubanenko).

(City planning) (Traffic engineering)

BOCHAROV, Yu.P., kand.arkhitektor; YEGOROV, Ya.L., inzh.

Some problems in the water supply of the cities of the R.S.F.S.R.
Vod. i san. tekh. no.10:25-27 O '64. (MIRA 18:3)

BOCHAROV, Ya.P.

Some problems of urban development in Japan. Vop. geog. no.66: 104-117 '65. (MIRA 18:6)

BOCHAROV, Yu. S. --

"The Growth of Human Integument." Can Biol Sci, Moscow Order of Lenin State U imeni M. V. Lomonosov, 15 Oct 54. (VM, 5 Oct 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (10)

SO: Sum. No. 481, 5 May 55

B-4

USSR/General Biology. Individual Development. Embryonic Development.

Abs Jour: Ref Zhur-Biol., No 20, 1958, 90364.

Author : Bocharov, Yu. S.
Inst : Leningrad Univ.
Title : The Embryonic Development of the Human Skin.

Orig Pub: S sb.: Probl. sovrem. embriologii. L., Un-t, 1956, 104-107.

Abstract: The skin of 5 weeks to 9 months old embryos was studied. The histo-genetic skin processes begin at the head end, and gradually develop toward the caudal and dorso-ventral regions. The embryonic histogenesis of the epidermis is composed of three generations of cells, which are produced by mitosis of the basal layer. The first two

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Abs Jour: Ref Zhur-Biol., No 4, 1958, 90364.

generations are temporary structures, and are replaced by horny cells (3rd generation). A close interrelation exists between the epidermis and derma. Changes in the derma as a result of any proliferation of the epidermis (the growth of hair) are reactive in nature and may be caused, depending on the type of inflammatory reaction. A.M. Zubin.

BOCHAROV, Yu.S., kandidat biologicheskikh nauk (Moskva)

Immunity and embryonic development of animals ("Immunity of embryos." B.P. Tokin. Reviewed by IU.S. Bocharov). Priroda 45 no.5:117-118 My '56. (MLRA 9:8)
(Immunity) (Embryology)
(Tokin, P.B.)

BOCHAROV, Yu.S.

Development of human epidermis layers and their partial reduction. Dokl. AN SSSR 109 no.2:421-424 Jl'56. (MIRA 9:10)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova. Predstavleno akademikom I.I. Shmalgauzenom.
(EPIDERMIS) (EMBRYOLOGY, HUMAN)

BOCHAROV, Yu.S.

On the genesis of "clear cells" of the human epidermis. Dokl. AN SSSR 109 no.3:667-669 Jl '56. (MIRA 9:10)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova. Predstavleno akademikom I.I. Shmal'gauzenom.
(EPIDERMIS) (EMBRYOLOGY, HUMAN)

S-4

USSR/Human and Animal Morphology. Skin

Abs Jour : Ref Zhur - Biol., No 7, 1958, No 31323

Author : Bocharov Yu.S.
Inst : Not Given
Title : On the Morpho-Physiological Interaction of the Epidermis and Dermis During the Development of the Skin of Man.

Orig Pub : Byul. Mosk. o-va ispyt. prirody. Otd. biol., 1957, 62, No 2, 106-109

Abstract : In the embryo of man, intensive growth of the epidermis is accompanied by monotype changes of the derma (increase of the plexus of blood-carrying vessel, emigration of leucocytes, strengthening by reproduction of tissue histiocytes). These phenomena occur only during the proliferation of the epithelium. With each proliferation of the cells of the epidermis, there is a corresponding reaction of the vessles and connective tissue of the dermis. The reaction of the dermis suggests an inflammatory reaction. The similarity of the

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21(3)

AUTHORS: Tinyakov, G. G., Arsen'yeva, M. A., Bocharov, Yu. S. SOV/20-122-5-14/56

TITLE: Age-Dependent Characteristic Features in the Structure of the Testicles of Apes and Their Reaction to an Ionizing Irradiation (Vozrastnyye osobennosti v stroyenii semennikov obez'yan i ikh reaktsiya na ioniziruyushcheye oblucheniye)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 5, pp 799 - 801 (USSR)

ABSTRACT: The present paper investigates the histological changes in the testicles of apes if exposed to the action of various doses of ionizing irradiation. The authors investigated the testicles of normal and of irradiated apes Macaca mulatta (rhesus), which had been killed at the Sukhumskaya mediko-biologicheskaya stantsiya AN SSSR (Sukhumi Medical-Biological Station of the Academy of Sciences USSR) and at the Institut po izucheniyu poliomielita (Institute for the Study of Poliomyelitis). A total of 47 animals of different ages was examined.

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Age-Dependent Characteristic Features in the Structure of the Testicles of Apes and Their Reaction to an Ionizing Irradiation SOV/2o-122-5-14/56

The conditions of irradiation were given. The testicles were fixed in 10% formalin. First, the normal structure of the testicles of Macaca mulatta is described in short. The test animals were subdivided into 2 groups: Group I comprises the animals which were irradiated before puberty, and group II the animals which were irradiated in the state of puberty. The histological structure of the animals of group I is very similar to the structure of the testicles of normal apes before the stage of puberty, and there is no spermatogenesis in their case. In apes, which were irradiated at the age of 2 years and were killed after further 2 years, the spermatic ducts develop asynchronously, for the irradiation of 2 years old apes delays the development of the spermatic ducts. In animals which were irradiated in the state of puberty with doses of from 150 to 400 r, an outwardly normal course is found to be taken by spermatogenesis 2 years after irradiation. However, in the testicles of these animals pyknotic degenerated nuclei are found

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to form more frequently than in normal cases. In animals which were irradiated before the state of puberty, spermatogenesis occurs two years later than in normal cases. A dose of more than 450 r renders the apes completely sterile. Certain harmful consequences caused by ionizing radiation remain as long as the animal lives. There are 2 figures and 4 references, 1 of which is Soviet.

ASSOCIATION: Institut biofiziki Akademii nauk SSSR (Institute of Biophysics of the Academy of Sciences USSR)

PRESENTED: May 24, 1958, by I.I.Shmal'gauzen, Academician

SUBMITTED: May 23, 1952

VYAZOV, O.Ye.; BOCHAROV, Yu. S.

Effect of immune sera on heart and crystalline lens growth in chick embryo cultures. Biul. eksp. biol. med. 47 no.1:83-86 Ja '59.
(MIRA 12:3)

1. Iz laboratorii immunologii embriogeneza (zav. - kand. med. nauk O. Ye. Vyazov) Instituta eksperimental'noy biologii (dir. - prof. I.N. Mayskiy) AMN SSSR, Moskva. Predstavlena deystvitel'nym chlenom AMN SSSR N.N. Zhukovym-Verzhnikovym.

(HEART,
tissue culture, eff. of immune sera on growth (Rus))
(CRYSTALLINE LENS,
same)
(IMMUNE SERUMS, effects,
on crystalline lens & heart growth in tissue culture (Rus))

BOCHAROV, Yu. S.

Melanoblast migration in the skin of human fetuses. Nauch. dokl. vys. shkoly; biol. nauki no.3:57-59 '60. (MIRA 13:9)

1. Rekomendovana kafedroy embriologii Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova.
(EMBRYOLOGY, HUMAN) (CHROMATOPHORES)

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S/747/62/000/000/008/025
D268/D307

27.1220

AUTHORS: Bocharov, Yu. S., Bocharov, Ye. V. and Mikheyeva, G. A.

TITLE: The comparative radiosensitivity of ovaries in monkeys (Macaca mulatta) and mice under x ray irradiation

SOURCE: Radiatsionnaya genetika; sbornik rabot. Otd. biol. nauk AN SSSR. Moscow, Izd-vo AN SSSR, 1962, 98-109

TEXT: Radiosensitivity was studied in ovarian follicles in 46 white mice (Kunminskaya line), old females being used to show minimal sensitivity, and 17 monkeys (two 2-year olds, and the rest 4 - 8 years), with mouse ovaries irradiated locally at 25, 50 and 100 r and 1 ovary per monkey at 50 and 100 r. Only follicles with clear indications of atresia were taken as moribund. X rays at 50 and 100 r had pronounced sterilizing effects on mice, primordial follicles being especially sensitive, some being damaged even at 25 r. There was sterilization at 24 hours and most damaged follicles were resorbed at the 30th day. In monkeys, ovarian follicles were unaffected at 50 r, the minimal dose being 100 r. At this

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dose there was 15 times less damage to primordial follicles in monkey than in mouse ovaries, while stratified and Graafian follicles were stimulated. Monkey ovaries were markedly more radiosensitive than mouse ovaries. In mice the sterilising effect of doses over 25 r is ascribed to the killing of ovarian follicles, while in monkeys, after 100 r, it is attributed basically to the induction of dominant lethals. The high radiosensitivity of monkey ovaries may result in the persistence of mutations and their transmission to the population. There are 6 tables.

ASSOCIATION: Institut biologicheskoy fiziki AN SSSR, Moskva (Institute of Biological Physics, AS USSR, Moscow)

BOCHAROV, Yu.S.

Binucleate oocytes in the oogenesis of macaques. Biul.MOIP. Otd.biol. 67 no.5:154-155 S-O '62. (MIRA 15:10)
(OOGENESIS)

BORSUK, R.A., red. (Moskva); BOCHAROV, Yu.S., red.(Moskva); GINZBURG, A.S., red.; YEMEL'YANOV, S.V., red.; LANGE, A.B., red.; LARIONOV, V.F., red.; MANUILOVA, N.A., red.; MATVEYEV, B.S., red.; PODDUBNAYA-ARNOL'DI, V.A., red.; POTEMKINA, D.A., red.; TRANKOVSKIY, D.A., red.; USTINOVA, Ye.I., red.; SHMIDT, G.A., red.; SHREDER, V.N., red.; NECHAYEVA, Ye.G., red.

[Problems in modern embryology] Problemy sovremennoi embriologii. Moskva, Izd-vo Mosk. univ., 1964. 565 p. (MIRA 17:5)

BOCHAROV, Yu.S., kand. biolog. nauk

Assembly of the International Union of Biological Sciences in Prague. Vest. AN SSSR 34 no.10:101-102 O '64.
(MIRA 17:11)

L 22551-66 EWT(m)

ACC NR: AP6004503 SOURCE CODE: UR/0404/65/000/002/0096/0099

23
B

AUTHOR: Bocharov, Yu. S.; Savitskiy, V. F.

ORG: none

TITLE: Spontaneous and radiation-induced chromosome aberrations in the bone marrow of mice of various ages

SOURCE: AN KazSSR. Izvestiya. Seriya biologicheskikh nauk, no. 2, 1965, 96-99

TOPIC TAGS: x ray irradiation, radiation damage, chromosome aberration

ABSTRACT: Spontaneous and radiation-induced chromosome aberrations in the bone marrow of newborn mice, of mice upon reaching sexual maturity, and of old mice were studied in order to determine the importance of age on the production of cells with chromosome aberrations. The experiment was performed on newborn mice and on mice 2 months old and 10 months old. In view of reports of differing radiation sensitivity in males and females, only males were used in the experiment. A single x-ray dose of 100 rad was administered with the RUP-1 machine; the parameters were as follows: voltage--190 kw, current--15 ma, filters--0.5 mm cu and 0.75 mm Al, focussing distance--64 cm, intensity of dose--19.3 pad/min. The mice were killed 2, 6, 12 and 24 hours following irradiation. Data on chromosome aberrations resulting from the irradiation are shown

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ACC NR: AP6004503

in a table. A high number of aberrations were in the newborn mice; the percentage dropped in the 2 month old mice and rose in the 10 month old specimens. The curves for radiation-induced aberrations corresponded to those for spontaneous aberrations for mice of various ages. It is concluded that in the ontogenesis of the animals, there is a period of maximum cytogenetic cellular stability which corresponds to the time the animal reaches sexual maturity. Orig. art. has: 1 table, 1 figure.

SUB CODE: 06/ SUBM DATE: 00/ ORIG REF: 000/ OTH REF: 004

Card 2/2 BK

BOCHAROVA, A.

Disturbance in the vertical image synchronization. Radio no.1: 36 Ja '61. (MIRA 14:9)
(Television—Repairing)

BOCHAROVA, A., inzh.

Special features of 110° picture tubes. Radio no.2:38 F '63.
(MIRA 16:2)
(Television—Picture tubes)

Name	:	BOCHAROVA, A. A.
Dissertation	:	Deep plowing for corn in field crop rotation on ordinary Chernozem soil of the Ukrainian steppe
Degree	:	Cand Agr Sci
Defended At	:	Voronezh Agricultural Inst
Publication Date, Place	:	1956, Moscow
Source	:	Knizhnaya Letopis' No 5, 1957

BOCHAROVA, A.A.

Effect of plowing depth on the weediness of soil and corn stands. Zemledelie 4 no.7:114-115 Jl '56. (MLRA 9:9)

1.Ukrainskiy nauchno-issledovatel'skiy institut zernovogo khozyaystva.
(Plowing) (Corn (Maize)) (Weed control)